

Escape from Model Land: some consequences of complexity in (climate) modelling

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Abstract

As computational power has increased, models in climate (and other fields) have become more complicated, with more detail, parameters, subroutines, processes, interactions and representations. This is done with the aim of improving the physical realism and therefore, hopefully, the accuracy of the model in making future projections. But the complexity also makes it very hard to assess that accuracy, for a number of reasons. Sensitivity to model structure is mathematically impossible to assess fully, and it is unclear exactly what it would mean even if we could quantify it. Closer to the modelling front, there are many interesting questions about how expert judgement is best used in the process of model development, calibration and evaluation. How do we get out of "model land" and make useful inferences which are about the real planet and not only about our simulations?